

THE CLAIMS

What is claimed is:

- 5 1. A carrier handling system for an assay testing diagnostic analyzer, comprising:
 - a loading bay for receiving and holding the plurality of carriers;
 - an identification device configured for identifying an identifying feature associated with the carriers to determine the type of contents loaded on each carrier; and
- 10 a transporter configured for transporting the carriers from the loading bay to a first or second location depending on the determined type of contents on each carrier for performing a diagnostic process using the contents, the transporter having random access to the plurality of carriers in the loading bay.
- 15 2. The carrier handling system of claim 1, wherein the identification device is configured for identifying the contents at least as being samples and reagents to be used in the diagnostic process, the identification device being associated with the transporter such that the transporter transports the samples to the first location and the reagents to the second location.
- 20 3. The carrier handling system of claim 2, wherein identification device is configured for identifying the type of the contents independently of information on where in the loading bay the carriers are located.
- 25 4. The carrier handling system of claim 3, wherein the transporter is configured for transporting the carriers from substantially any location in the loading bay to the respective first or second location.
- 30 5. The carrier handling system of claim 1, further comprising a first carrier support member that comprises the first location and which is disposed for access by a diagnostic module that is configured for performing the diagnostic process, wherein the transport is configured for transporting the carriers from the loading bay to the first carrier support.

6. The carrier handling system of claim 5, wherein the transporter is configured for transporting the carrier from the first location to another location on the first carrier support.

5 7. The carrier handling system of claim 6, wherein the first location comprises a plurality of first locations on the first carrier support, such that a plurality of carriers can be disposed on the carrier support at the same time.

10 8. The carrier handling system of claim 5, wherein the first carrier support comprises a positioner configured to receive and move the carrier such that the diagnostic module can test contents in the carrier.

15 9. The carrier handling system of claim 1, wherein the identifying feature comprises an optically readable feature, and the identification device comprises an optical reader capable of reading the optically readable feature.

10. The carrier handling system of claim 1, wherein the identifying feature comprises a physical characteristic of the carriers.

20 11. A diagnostic system, comprising:
the carrier handling system of claim 1;
a diagnostic module configured for conducting the diagnostic operation.

25 12. The carrier handling device of claim 1, further comprising a programmable computer for controlling the movement of the transporter based on input data and a preprogrammed priority order for processing a plurality of samples.

30 13. The carrier handling device of claim 1, further comprising the carriers, wherein at least some of the carriers are configured for holding containers that contain reagents, the carriers or containers having the identifying feature for identifying the contents as being reagents.

14. A method for loading an assay testing diagnostic analyzer, comprising:
loading samples to be tested into the system;

loading into the analyzer reagent carriers that hold containers of regents; transporting the reagent carriers to a reagent holding location with an automated transporter; and testing the samples with the reagents with the analyzer.

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15. An assay testing diagnostic analyzer substance carrier, comprising: a carrier body configured for being handled and received in an assay testing diagnostic analyzer configured for testing samples with reagents; and at least one container holding portion configured for holding a container that 10 contains a fluid substance, wherein the holding portion is configured for moving the container to stir or mix the contents of the container.

16. The carrier of claim 15, wherein the holding portion comprises a plurality of holding portions.

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17. The carrier of claim 16, wherein fewer than all of holding portions are configured for moving a hold container with respect to the body associated with the first engagement portion for the moving of the containers held thereby with respect to the body.

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18. The carrier of claim 15, wherein at least one holding portion is configured for rotating the container held thereby with respect to the body.

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19. The carrier of claim 15, further comprising a first engagement portion engageable with a second portion of the diagnostic analyzer for moving the container held by the holding portion with respect to the body in response to relative motion between the first and second engagement portions.

20. The carrier of claim 19, wherein the first engagement member comprises is rotatable and configured for rolling against the second engagement member.

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21. An assay testing diagnostic analyzer system, comprising: the carrier of claim 20; a diagnostic analyzer including a diagnostic module configured for conducting a diagnostic process using the substance; a rotating carrousel configured for receiving the carrier mounted thereon;

the second engagement member, which comprises a ring gear disposed adjacent the carousel and meshable with the gear of the first engagement member mounted on the carousel for rotating the container associated with the first engagement member upon relative rotation between the carousel and the ring gear.

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22. The diagnostic system of claim 21, further comprising:
a loading bay for loading the carrier into the diagnostic analyzer; and
a transporter configured for transporting the carrier from the loading bay to the carousel;

10 wherein the carousel comprises a retention member associable with the carrier for locking the carousel thereto.

23. The carrier of claim 15, wherein the holding portion is configured for gripping the container.

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24. The carrier of claim 15, wherein the body comprises:
a handle portion to facilitate grasping of the loaded carrier by hand; and
a transporter coupling portion for coupling with the transporter to enable the transporting of the carrier.

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25. An assay testing diagnostic analyzer system, comprising:
a loading bay for loading a plurality of carriers that are configured for holding containers that contain fluid substances for use in a diagnostic process;
a positioner device configured for receiving and positioning the carriers for access by a diagnostic module to perform the diagnostic process;
a transporter configured for transporting the carriers from the loading bay to the positioner device;
a retention member associated with the positioner device and configured for locking the carriers to the positioner, the retention member being operatively associated with the transporter for releasing the carriers therefrom to enable the transporter to transport the carrier from the positioner device.

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26. The diagnostic system of claim 25, wherein the positioner device is driven to position the carriers for access by the diagnostic module.

27. The diagnostic system of claim 26, wherein the positioning device comprises a rotating carousel .

5 28. The diagnostic system of claim 25, further comprising the diagnostic module, which is configured for performing the diagnostic process by accessing and combining the substances from one of the containers and also another substance to perform the diagnostic process.

10 29. The diagnostic system of claim 28, wherein the substance in the container comprises a reagent, and the other substance comprises a sample.

15 30. The diagnostic system of claim 25, further comprising an activation member operably associated with the transporter for releasing at least one of the carriers when the transporter is in contact with the activation member.

20 31. The diagnostic system of claim 30, further comprising a carrier locking member configured for moving with respect to the carousel in association with the carrier for locking and unlocking the carrier with respect to the positioner, the activation member being configured for being displaced by the transporter to move the locking member for the locking and unlocking of the carrier.

25 32. The diagnostic system of claim 25, wherein the retention member comprises first latching member configured for lockingly latching to a second latching member of at least one of the carriers for locking the carrier to the positioner, the retention member being configured for relatively moving the latching members for locking and unlocking the carrier.

30 33. The diagnostic system of claim 32, further comprising a locking member movable with respect to the positioner and associated with the carrier for moving the second latching member with respect to the first latching member for locking and unlocking the carrier.

34. The diagnostic system of claim 33, further comprising an activation member operatively associated with the transporter for releasing the carrier when the transporter is in contact with the activation member, the locking member comprising a tab that is received in a recess of the carrier and which is configured for sliding the carrier with respect to the latching member.

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35. The diagnostic system of claim 25, further comprising:
the plurality of carriers;
a plurality of the retention members;
10 a carrier sensor configured for detecting the presence of the carriers on the positioner.

36. The diagnostic system of claim 35, wherein the carriers have an identifying feature, the diagnostic system further comprising:
15 an identification device configured for identifying the identifying feature of the carriers; and
a programmable computer for controlling the movement of the transporter and the positioner based on input data and a preprogrammed priority order for processing a the contents of the carriers based on the identified identifying feature.

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